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ABSTRACT

In a study with seventh- and eighth-graders, Spanish-English bilinguals (n=41) and English monolinguals (n=48) used brief English contexts to choose among possible meanings for unfamiliar words. Two types of errors were compared: transfer errors, which were answers consistent with Spanish but not English syntax, and non-transfer errors, which were inconsistent with the syntax of both languages. Non-transfer errors were found to be negatively correlated with reading proficiency in both Spanish and English. Transfer errors were positively correlated with reading proficiency in Spanish and were unrelated to English reading proficiency. First-language syntactic knowledge was thus found to influence guesses about the meanings of unfamiliar words in a second-language context. The effects was found among bilinguals who had experienced a variety of amounts and types of exposure to English. (Author/MSE)

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LINGUISTIC TRANSFER AND THE USE OF CONTEXT BY SPANISH-ENGLISH BILINGUALS

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Center for the Study of Reading

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Abstract

In this study, Spanish-English bilinguals and English monolinguals used brief English contexts to choose among possible meanings for unfamiliar words. Two types of errors were compared: Transfer errors, which were answers consistent with Spanish, but not English, syntax; and non-transfer errors, which were inconsistent with the syntax of both languages. Non-transfer errors were found to be negatively correlated with reading proficiency in both Spanish and English. Transfer errors, on the other hand, were positively correlated with reading proficiency in Spanish, and were unrelated to English reading proficiency. First-language syntactic knowledge was thus found to influence guesses about the meanings of unfamiliar words in a second-language context. This effect was found among bilinguals who had experienced a variety of amounts and types of exposure to English.

Linguistic Transfer and the Use of Context by Spanish-English Bilinguals

In this study we investigate the effects of Spanish-English bilinguals' first-language syntactic knowledge on the guesses they make about the meanings of new words encountered in English contexts. Our goals are to examine a particular type of transfer, and to gain a better understanding of the process of vocabulary acquisition in second-language readers, a group that constitutes an increasingly large segment of the U.S. school population.

In the field of second-language acquisition there has been a renewed interest in vocabulary (Ard & Homburg, 1983; Carter, 1987; Carter & McCarthy, 1988; Gairns & Redman, 1986; Meara, 1987; Nation, 1990; Nation & Carter, 1989; Olshtain, 1987; Palmberg, 1987). Vocabulary knowledge is seen as including not just knowledge of individual words, but also lexical processing, which includes knowledge of the strategies that allow learners to make inferences about the meanings of new words (Dollerup, Glahn, & Rosenberg Hansen, 1989; Færch, Haastrup, & Phillipson 1984; Haastrup 1989). Making inferences about the meanings of new words is essential for large-scale growth in reading vocabulary (Nagy & Anderson, 1984; Nagy, Anderson, & Herman, 1987), and for negotiating text with a high proportion of unfamiliar vocabulary, as is common in the experience of second-language readers. Second-language readers are able to gain significant information about new words from context (Dupuy & Krashen, 1993; Elley, 1991). But inferring the meanings of new words is a complex process (McKeown, 1985) that can be especially difficult for readers with limited second-language proficiency (Cziko, 1978; Haynes, 1993). We still know relatively little about how the process of vocabulary acquisition in a second language differs from vocabulary acquisition in one's first language.

Cziko's (1978) research on the use of context by first- and second-language readers suggests that second-language readers are able to make some use of local (syntactic) context, but even at intermediate levels of second-language proficiency, they have difficulty getting additional information from global (discourse) context. The results of Haynes' (1993) study support this conclusion. Second-language readers were successful in guessing the meanings of words when information about the meaning was provided by local context, but were less successful when inferring the meaning required integrated comprehension of the passage as a whole.

These studies provide strong evidence that for some second-language readers, global context poses a greater difficulty than local context. However, it should not therefore be assumed that the use of local context presents no problem. Cziko's intermediate level second-language readers had had considerable experience in their second language (they were English-speaking seventh-grade students who had received 30 to 45 minutes a day of instruction in French as a second language since grade one and 70% of their instruction in French during seventh grade), but their ability to use local context was still far below that of French native speakers and advanced learners of French as a second language.

The syntactic context constitutes an important component of the information provided by local context; extraction of other types of information from the local context is also mediated by the syntactic structure (Nagy & Gentner, 1990). There are three related reasons why second-language readers may have trouble using syntactic information in inferring the meanings of unfamiliar words: First, the clues to a word's meaning may involve syntactic detail known only by those who have attained a very high level of second-language proficiency. Second, inferring the meaning of a word may require productive rather than receptive knowledge of a syntactic construction. Third, the reader's first language syntactic knowledge may influence the hypotheses made about the meaning of a new word. It is this third factor, cross-linguistic transfer of syntactic knowledge, which is the particular focus of this study.

The Role of First-Language Knowledge in Second-Language Vocabulary Acquisition

In the seventies, studies of transfer, shaped up to that time predominantly by the behaviorist paradigm, went into temporary eclipse. The rise of cognitive psychology and Chomskian linguistics led to approaches in second-language acquisition research that emphasized the learners' active and creative construction (e.g., Dulay & Burt 1974, 1975). However, since the existence of cross-linguistic influences is undeniable, the reconceptualization of transfer as a process within a cognitivist paradigm soon followed, and during the last few years cross-linguistic phenomena have received increasing attention (e.g., Gass & Selinker, 1983; Kellerman, 1979, 1986; Kellerman & Sharwood Smith, 1986; McClure & Branstine, 1990; McLaughlin, 1987; Odlin, 1989).

As Adjémian (1983) has noted, one aspect of first-language knowledge that may transfer to learning in a second language involves the relationships between syntactic and semantic properties of lexical items. In any language, there are at least partial regularities between the meaning of a word and its syntactic function. For example, consider the possible meanings for the verb *blented* in the sentence "John blented that he went into the room." The syntax of the sentence--the fact that *blented* is followed by a sentence complement with *that* as the complementizer--tells us that *blented* could be a verb of speaking, or perception, or mental state, but not a verb of motion. That is, *blented* might mean something like "believed" or "said" or "saw", but not "ran." The complementizer *that* gives further detailed information about the meaning of the verb *blented* as well, that depends on detailed, language-specific knowledge of the relationship between verbs and complementizers in English--the fact that *blented* might mean "expected" or "hoped," but not "forced" or "attempted."

The knowledge that allows us to make such predictions about the meaning of *blented* is not necessary for comprehension, given that one already knows all the meanings of the words in the sentence. A reader can understand the sentence "John said that he went into the room" without knowing the fact that English verbs of speaking often take *that* as a complementizer--the presence of both *said* and *that* in the sentence make such knowledge redundant. However, what is redundant for comprehension, when the meanings of all the words are known, can become crucial when the meaning of a new word must be inferred.

Researchers in child language have recently emphasized the importance of syntax in the acquisition of verb meanings (e.g., Gleitman, 1990; Naigles, 1990; Naigles, Gleitman, & Gleitman, in press). In these studies, they have focused on those aspects of syntactic structure which are common to different languages. In the research proposed here, on the other hand, we are more interested in what is not universal, that is, in syntactic differences among languages that may lead to problems for second-language learners.

Our focus likewise differs from that of research on cross-linguistic transfer based on the Competition Model (Gass, 1987; Koda, 1993; Sasaki, 1991). Such research investigates possible transfer of general syntactic strategies, for example, the relative reliance placed on different sources of information such as word order and case markings. The present study, on the other hand, is concerned with the transfer of relatively specific syntactic knowledge.

In this study, we set out to test the hypothesis that knowledge of relationships between the lexical meanings of verbs and their syntactic behavior in a first language influences the hypotheses that readers make about the meanings of unfamiliar verbs encountered in a second-language text. We also wanted to find out under what conditions of second-language acquisition such transfer takes place--for example, whether the level of transfer depends on the age of initial acquisition of English, or the language(s) spoken in the home.

In particular, we looked at how syntactic differences between English and Spanish influence the inferences that Spanish-English bilingual students make about the meanings of unfamiliar words encountered while reading. We identified a number of syntactic constructions in English and Spanish which, though superficially similar, create different expectations about the meanings of unfamiliar words occurring in these constructions. For example, in the sentence frame *The researchers* _____ *to test students individually*, English syntax would allow words such as *want*, *expect*, *need*, or *hope*, but not *require*. On the other hand, in the corresponding sentence in Spanish, the translation equivalent of *require* is permissible. We call such constructions "deceptively parallel."

In pilot testing, we found that when encountering new words in deceptively parallel constructions in English, students whose native language is Spanish make different inferences about their meanings than do native speakers of English, including some bilinguals who had achieved high levels of proficiency in English. One of the purposes of this study was therefore to see whether the effects of first-language syntax on inferences about new words in second-language contexts depend in any way on the conditions under which the second language has been acquired.

Method

Subjects

Subjects in this study included three groups of seventh- and eighth-grade students. The first group consisted of 41 Spanish-English bilingual students who were in bilingual education classes in an urban school district. We will refer to this as the Bilingual Instruction group. The second group consisted of 59 students in a predominantly Hispanic urban school who were not currently in bilingual education classes. We will refer to this group as the English-only Instruction group. On the basis of a language background questionnaire (see below), 14 students in this latter group who reported that they spoke no Spanish were excluded from the analyses reported in this study. The English-only Instruction group therefore consisted of 45 self-reported bilinguals. The third group consisted of 48 seventh-grade students from a small town in East Central Illinois. We will refer to this group as Monolingual; data from students identified by teachers as non-native speakers of English were excluded.

The main experimental task was also administered to 15 Spanish-English bilingual graduate students from Spain and several Latin American countries. Means for this group are reported, but because these international graduate students differ in age from the other subjects, and constitute a highly select group in terms of verbal ability, their data were not included in the statistical analyses.

Materials

Multiple choice context task. We began by identifying syntactic structures in English which exemplified what we have called a "deceptive parallelism" to Spanish. "Deceptively parallel structures" are syntactic structures for which there is roughly a one-to-one mapping between the linguistic units in English and Spanish, excluding inflectional endings and the position of adjectives relative to nouns, but in which one language allows a different range of lexical items. A Multiple Choice Context Task was created with items reflecting a variety of such structures.

Table 1 gives a sample item from the Multiple Choice Context Task. The task was to choose which of four possible meanings was most appropriate for a nonsense word embedded in a short (1-3 sentences) English context. Two versions of each item were constructed, a transfer version and a non-transfer version. The transfer version of each item capitalizes on a deceptive parallelism between Spanish and English. In the transfer version of the item in Table 1, for example, English allows only (c) *start* as a correct answer. However, option (b) *order* is consistent with Spanish syntax. That is, in Spanish, one can say *El maestro mandó ir al pazarrón y escribir la respuesta*--translated word-for-word, *The teacher*

ordered to go to the board and write the answer. On the basis of Spanish syntax, then, both (b) and (c) are possible answers. The other two choices, in this case (a) and (d), were chosen to be inappropriate in terms of the syntax of either language.

In pilot testing of this and other similar items, Spanish-dominant bilinguals who were highly proficient in English nevertheless sometimes chose options which, like (b) *order* in this example, were consistent with Spanish, but not English, syntax. We therefore categorize the (b) distractor of the transfer version of this item as a "transfer error."[1]

It should be noted that the choice among the four options is not simply a matter of lexical semantics; it depends on the local syntactic context. The fact that *ordered* does not fit the English context, whereas *mandó* does fit the equivalent Spanish context, is not just an idiosyncratic difference between the behavior of a particular verb in English, and that of its translation in Spanish. This pattern holds for most verbs with related meanings in each language. In English, verbs such as *command, order,* and *require* must have a direct object before the infinitive phrase. In Spanish, on the other hand, verbs of this category allow the logical subject of the embedded clause to be deleted, even though it is not coreferential with the subject of the sentence.

[Insert Table 1 about here.]

There may, of course, be reasons other than cross-linguistic transfer that a subject might choose (b) for this item. To help determine the extent to which the choice of a "transfer error" option actually reflects transfer, a Non-Transfer Version of each item was constructed, as illustrated in Table 1. The set of choices was always the same for both versions of the item. The lexical content of the item was preserved as much as possible, and the syntax was changed slightly, to achieve two effects. First, the distractor which served as the transfer error in the Transfer Version became the correct answer for the Non-Transfer Version. Second, the syntax of the Non-Transfer version of the item avoided deceptive parallelism. Spanish syntactic knowledge, to the extent that it was applicable, would result in a choice of the correct answer. The choice of any distractor for this type of item therefore constitutes a non-transfer error.

A total of 22 transfer items were written, representing five categories of English syntactic constructions which displayed deceptive parallelism with English. Two versions of the task were constructed; each one contained either the transfer or non-transfer version of a given item. The complete task consisted of 2 practice items, 11 transfer version items, 11 non-transfer version items, and 3 filler items. Examples of items illustrating each of the categories of syntactic constructions can be found in the Appendix.

Two variables were computed from subjects' performance on the multiple-choice task. One was Transfer Errors, defined as the proportion of transfer items on which the subject made a transfer error. The other was Non-Transfer Errors, defined as the proportion of non-transfer items on which the subject made any error. (Non-transfer errors for transfer items were excluded from the analysis, in order to ensure that the variables Transfer Errors and Non-Transfer Errors were statistically independent.)

Reading proficiency. English reading proficiency of the Bilingual Instruction and English-Only Instruction students was measured using the Reading (Vocabulary and Comprehension) subtest of the English-language TABE (Test of Adult Basic Education), Survey Form, Level M. Spanish reading proficiency of the Bilingual Instruction subjects was measured using the TABE *Español Lectura* (reading) subtest, which is designed to be equivalent to, but not a translation of, the English-language version.

Language background questionnaire. A Language Background Questionnaire was constructed, in which students were asked about their learning and use of Spanish and English in several contexts. The items from this questionnaire, along with the percentage of students giving specific types of responses, are given in Table 2.

[Insert Table 2 about here.]

Procedures

All subjects were tested in intact classroom groups, to maximize the number of students that could be included in the study. Monolingual subjects were given only the Multiple Choice Context Task.

Subjects in the Bilingual Instruction group were tested in two 45-minute sessions, one in the morning, and one in the afternoon of the same day. During the first session, subjects were given the Multiple Choice Context Task, and then the Reading subtest of the English-language TABE. During the afternoon session, subjects took the Spanish-language version of the TABE, and then completed the Language Background Questionnaire. Subjects in the English-Only Instruction group were tested in a single session, in which they were given the Multiple Choice Context Task, the Reading subtest of the English-language TABE, and the Language Background Questionnaire.

Results

Language Background Questionnaire

Table 2 gives the percentage of students in the Bilingual Instruction and English-Only Instruction groups responding in various ways to selected questions in the Language Background Questionnaire. Although there is some overlap between the groups, they differ significantly for every measure of language use or language-related experiences. Students in the Bilingual Instruction group were mostly born outside of the continental U.S. They all reported being able to read in Spanish, and were more likely than students in the English-only Instruction group to use Spanish with parents, siblings, and friends.

Reading Proficiency

Students in the Bilingual Instruction group had a mean of 38% correct (SD = 16) on the English-language TABE. According to norms provided by the publishers, this mean is equivalent to a third-grade reading level. The Bilingual Instruction group's mean for the Spanish-language TABE was 48% (SD = 14), which is also equivalent to a third-grade reading level.

Students in the English-Only Instruction group had a mean of 70% correct (SD = 20) on the English-language TABE, equivalent to about a fifth-grade reading level. The difference in English reading proficiency between the Bilingual Instruction and English-Only Instruction groups was significant, $F(1,85) = 72.0$, $p < .001$.

Multiple Choice Context Task

Table 3 gives the proportion of Transfer and Non-Transfer errors made by the four groups of subjects on the Multiple Choice Context Task.

[Insert Table 3 about here.]

An analysis of variance for the transfer errors (excluding data from the graduate student group) revealed a significant effect of group, $F(2,133) = 6.4$, $p < .01$. Scheffé post-hoc tests showed that the means for

Monolingual students were significantly different from those for both Bilingual Instruction and English-Only Instruction students. A parallel analysis for non-transfer errors gave similar results. There was a main effect of group, $F(2,133) = 46.5$, $p < .01$. Again, means for the Monolingual students were different from those for both Bilingual Instruction and English-Only Instruction students. Analyses using the item as the unit of analysis found that there were significant differences by group (Bilingual Instruction, English-Only Instruction, and Monolingual) for Transfer Errors, $F(2,42) = 3.78$, $p = .031$, and for Non-Transfer Errors, $F(2,46) = 62.52$, $p < .001$.

The results given in Table 3 are depicted graphically in Figure 1. The y-axis represents proportion of errors -- for Transfer items, the proportion of items for which the Transfer Error distractor was chosen, and for Non-Transfer items, the proportion of items for which any incorrect answer was chosen.

[Insert Figure 1 about here.]

These results are consistent with the hypothesis that Transfer Errors represent the use of first-language syntactic knowledge in using context to make guesses about the meanings of unfamiliar words. However, subjects in the Monolingual group, like the English-Only Instruction group and Spanish graduate students, made more Transfer Errors than Non-Transfer Errors. Furthermore, one might expect the Bilingual Instruction group to be the most prone to Transfer Errors, but this is the only group that makes more Non-Transfer Errors than Transfer Errors. Hence, at first glance, the results also appear to be consistent with the hypothesis that Transfer Errors are simply more seductive as distractors than Non-Transfer Errors. A closer examination of the data is therefore necessary to see whether or not there is convincing evidence for transfer.

A comparison of the means of the four groups shows that Transfer and Non-Transfer Errors appear to behave differently. Bilingual Graduate Students make almost as few Non-Transfer Errors as the Monolinguals, but they make the greatest number of Transfer Errors. Likewise, English-Only Instruction students make far fewer Non-Transfer Errors than Bilingual Instruction students, but slightly more transfer errors.

Correlations between Transfer and Non-Transfer Errors

Correlations between Transfer and Non-Transfer Errors indicate that the relationship between the two error types is different for the three groups. For Monolingual students, there is a significant positive correlation between the two, $r = .41$, $p < .01$. For English-Only Instruction students, the two types of errors are not correlated, $r = .11$. For Bilingual Instruction students, there is a significant negative correlation between the two types of errors, $r = -.34$, $p < .05$.

A similar pattern is found when data for students in the Bilingual Instruction and English-Only Instruction groups are re-divided on the basis of length of residence in the U.S. For students who have been in the U.S. for more than 10 years ($n = 45$), there is no correlation, $r = -.01$. For students who have been in the U.S. 4-9 years ($n = 25$), the correlation is nonsignificant but negative, $r = -.25$. But for students who have been in the U.S. less than 4 years ($n = 18$), there is a strong negative relationship between Transfer and Non-Transfer Errors, $r = -.63$.

Among Monolingual students, then, the two error types function similarly; those who make more of one type of error are likely to make more of the other as well. This does not hold for bilingual students. The negative correlation between the two error types for the students with the least exposure to English may indicate that students who are not able to process the English text sufficiently well are not seduced by the deceptive parallelisms between English and Spanish.

Error Types and Reading Proficiency

To look at the relationship between English reading proficiency and errors on the Multiple Choice Context Task, we combined the data from the Bilingual Instruction and English-Only Instruction groups, to examine the relationship over the broadest possible range of English reading proficiency levels. English reading proficiency is significantly negatively correlated with Non-Transfer Errors, $r = -.65$, $p < .001$, but not with Transfer Errors, $r = .05$. Figure 2 portrays the relationship between English reading proficiency and the two error types, with students from the combined Bilingual Instruction and English-Only Instruction groups divided into quartiles on the basis of their English reading proficiency. (Bars representing the means for the Monolingual group are given at the right, for the purpose of comparison.) The Figure and the correlations show the same picture: There is a strong negative relationship between English reading proficiency and Non-Transfer Errors, whereas Transfer Errors are present to the same degree at all levels of English reading proficiency.

[Insert Figure 2 about here.]

For students in the Bilingual Instruction group, we had measures of reading proficiency in both English and Spanish. The correlations between measures of reading proficiency in the two languages were high, $r = .69$, $p = .01$. Non-Transfer Errors were negatively related both to Spanish reading proficiency, $r = -.43$, $p < .01$, and English reading proficiency, $r = -.47$, $p < .01$. As in the analysis with the combined groups, Transfer Errors were not related to English reading proficiency, $r = .15$, $p = .18$. However, there was a significant positive relationship between Transfer Errors and Spanish reading proficiency, $r = .35$, $p = .012$. This relationship remained significant when English reading proficiency was controlled for.

Error Types and Language Background

Data from the Bilingual Instruction and English-Only Instruction groups were combined to examine the relationship between students' performance on the Multiple Choice Context Task and their responses on the Language Background Questionnaire. One-way analyses of variance were used, with the proportion of Transfer Errors and Non-Transfer errors as independent variables, and response categories as dependent variables.

No questionnaire items were found to be significantly related to proportion of Transfer Errors. However, proportion of Non-Transfer Errors was related to a number of items on the questionnaire. More Non-Transfer Errors were made by students who were born outside of the continental United States, who had lived in the U.S. for fewer years, who reported beginning to learn English at a later point in life, who said they could read better in Spanish than in English, and who reported using Spanish more often than English with siblings and friends.

Figure 3 depicts the relationship between the two error types and students' length of residence in the U.S. The picture is substantially the same as that in Figure 2. Transfer Errors appear to be found more or less uniformly across levels of English proficiency and length of residence in the U.S.

[Insert Figure 3 about here.]

Discussion

To summarize the results, Spanish-English bilinguals make significantly more Transfer Errors and Non-Transfer Errors than do monolingual English students. However, Non-Transfer Errors are negatively related to reading proficiency in both English and Spanish, whereas Transfer Errors are not related to English reading proficiency, and are positively related to reading proficiency in Spanish. Transfer and

Non-Transfer Errors are positively correlated for English-speaking monolinguals, but negatively correlated for those Spanish-English bilinguals who have spent the least amount of time living in the continental U.S.

Do Transfer Errors really reflect transfer? An alternative hypothesis is that the transfer error choices are simply more plausible than other types of wrong answers. On this basis, one would predict that all students would make more Transfer Errors than Non-Transfer Errors, except those who read so poorly that their responses appear to become random. This hypothesis would account for the fact that monolingual English speakers make more Transfer Errors than Non-Transfer Errors, and is consistent with the means for the Bilingual Instruction and English-Only Instruction groups.

This latter hypothesis does not, however, account for the fact that Transfer Errors are related positively to Spanish reading proficiency, and are unrelated to English reading proficiency. Nor does it explain why there should be a positive correlation between Transfer and Non-Transfer Errors for monolinguals, and a negative correlation for bilinguals. Finally, it does not explain why the Spanish graduate students, whose English reading proficiency is high (as evidenced by their low rate of Non-Transfer Errors) have the highest rate of Transfer Errors. The combination of results therefore supports the hypothesis that Spanish-English bilinguals are influenced by their first-language syntactic knowledge when they make guesses about the meanings of unfamiliar words in English.

It is somewhat surprising that Transfer Errors are not significantly related to English proficiency, nor to any of the variables from the Language Background Questionnaire. One might have expected that students less proficient in reading English, or who use English less often with family and friends, would be more prone to make transfer errors. There are several possible reasons for this lack of relationship between Transfer Errors and other variables. One is that transfer errors of the sort measured in this study persist at even high levels of second-language proficiency. This is consistent with the high rate of errors made by Spanish graduate students. Some of these graduate students appeared to have reached near-native fluency in English, and yet still made many transfer errors. Another explanation is based on the assumption that some level of English proficiency is necessary before transfer becomes possible. The syntactic context must be understood to some degree before bilingual students can be misled by it. Students with the lowest proficiency in English, who might otherwise be expected to make many transfer errors, may not be processing the English syntactic contexts in this study thoroughly enough to be led astray by their deceptive similarity to Spanish.

It should also be recognized that among the bilingual students, the best readers of English are not necessarily those students who know the least Spanish. On the contrary, there is a strong correlation between measures of reading proficiency in the two languages; the best readers in English may be those who capitalize on the relationship between the two languages (Jiménez, García, & Pearson, 1995).

An important limitation of this study is that, although it documents the existence of a certain type of cross-linguistic transfer, it does not provide a basis for determining the extent of such transfer in second-language reading. There are at least four points at which more research is necessary to determine the extent to which transfer errors of the sort examined in this study have an impact on the acquisition of reading vocabulary by second-language readers.

First, we do not know how common deceptive parallelism is in natural text. Our search for instances of deceptive parallelism between English and Spanish was not exhaustive. However, it left the impression that such constructions, though by no means rare, constitute a minority of English syntactic patterns.

Second, we have examined cross-linguistic transfer only in the context of Spanish-English bilingualism. It remains to be seen how much deceptive parallelism would be found for other pairs of languages.

Third, it is possible that the multiple-choice format used in this study may have influenced the proportion of transfer errors. Specifically, it could be asked whether having Transfer Errors as one type of distractor might not have acted as a form of entrapment. To address this question, we administered an open-ended version of the task to 24 students from the same population as the Bilingual Instruction group. For transfer items, 17% of their interpretable responses were transfer errors; for non-transfer items, 28% of their interpretable responses were Non-Transfer Errors. These numbers are lower than the 24% Transfer Errors and 43% Non-Transfer Errors made by the students in the Bilingual Instruction group on the multiple choice version of the task, but also clearly show that a substantial number of transfer errors also occur in an open-ended format.

Fourth, local syntactic context is only one of the sources of information about an unfamiliar word. It is possible that had we used longer, more authentic contexts, other discourse information might have overridden the effects of deceptive parallelism. On the other hand, of course, Cziko's (1978) and Haynes' (1993) work suggests that relatively speaking, second-language readers are more reliant on local context than on more global context.

Whatever the extent to which effects of first-language syntactic knowledge might be found in longer contexts and more authentic reading situations, the findings of this study underline the need for caution concerning the informativeness of linguistic context for second-language readers. The strong negative correlation between English reading proficiency and Non-Transfer Errors confirms Cziko's findings that high levels of second-language proficiency are necessary before local context can be used effectively. Only the top 25% of the bilingual subjects in the study had a Non-Transfer Error rate as low as that of monolinguals (see Figure 2).

What implications do our findings have for the instruction of second-language readers? Second-language readers encounter large numbers of new words while reading; there is no question that they must develop strategies for dealing with these words. Any such help must recognize both the strengths and weaknesses of second-language readers, and moreover, the strengths and weaknesses of different potential sources of information about new words.

Research on the usefulness of context conveys a somewhat paradoxical picture. On the one hand, there is some evidence that first-language learners acquire large amounts of their vocabulary from written context (Krashen, 1989; Nagy, Anderson, & Herman, 1987; Nagy, Herman, & Anderson, 1985), and that the benefits of extensive exposure to print are even greater for second-language readers than for first-language readers (Elley, 1991). On the other hand, there are also demonstrations of the ineffectiveness of context for first-language readers (e.g., Schatz & Baldwin, 1986), and of second-language readers' relative disadvantage in using context to infer the meanings of new words.

This paradox can be resolved, at least to some extent, by specifying more clearly what is covered by the term "context." A single exposure to a new word in a two- or three-sentence context is unlikely to provide much helpful information about that word's meaning (Schatz & Baldwin, 1986). However, repeated exposure to words in extended contexts can, over a period of time, lead to substantial gains in vocabulary knowledge (Nagy, Anderson, & Herman, 1987).

Local linguistic context, of questionable value even for first-language readers, is an even less reliable source of information for second-language readers. However, there are other points at which second-language readers may be on an equal footing, or even have an advantage with respect to some first-language readers. One such point concerns the difference between learning new concepts and new labels. First-language research has shown that it is more difficult for a reader to infer the meaning of a word from context if that word represents an unfamiliar concept (Nagy, Anderson, & Herman, 1987; Sheffelbine, 1990; Shu, Anderson, & Zhang, 1995). Second-language readers are, in some cases, in the position of having to learn a new label for a familiar concept, rather than learning a completely new concept.

Along similar lines, extensive topical knowledge can help to compensate for lack of help from local linguistic context. Parry's (1993) study of a Japanese university student's acquisition of English vocabulary illustrates the point. This student was far more successful at acquiring vocabulary in a particular domain than would be expected on the basis of other research on inferring word meanings from context. Parry attributes this student's success to two factors: the student's strategic capability as an adult learner, and the fact that the context involved consisted of multiple, extended texts on a topic in which the student was developing rich and extensive knowledge. It is interesting to note, however, that Parry's student still experienced difficulty using local syntactic and morphological context.

We would also like to stress the fact that, athough this study focused in particular on negative transfer, such transfer is only one part of the picture. The strong correlation between reading proficiency measures in English and Spanish and the strong negative relationship between Spanish reading proficiency and Non-Transfer Errors support the view that some components of reading ability are not language-specific, and that knowledge about reading gained in one language can transfer to reading in another (Langer, Bartholome, Vasquez, & Lucas, 1990).

Conclusion

The findings from this study confirm earlier research that indicates that a high level of proficiency in a second language is necessary before the reader can make guesses about the meanings of unfamiliar words with native-like accuracy. However, they also show that a distinction must be made between errors resulting simply from lack of proficiency in the second language, and errors resulting from syntactic differences between the readers' first and second languages. Bilinguals made transfer errors reflecting the use of first-language syntactic knowledge in making guesses about the meanings of words encountered in second-language contexts at rates significantly greater than those of monolinguals over a range of amounts and types of exposure to their second language.

One educational implication of our findings is the importance of not overestimating the informativeness of linguistic (and especially syntactic) context for second-language readers. Some of the information that makes the meaning of a new word obvious to the first-language reader may be conveyed by syntactic detail that a second-language reader cannot yet utilize. We would also stress, however, that syntactic context is only one aspect of the contextual information that allows a reader to make inferences about the meaning of a new word.

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Footnote

[1]Since both choices (b) and (c) are consistent with Spanish syntax, the number of Transfer Errors made by a subject would not necessarily reflect the full extent of a subject's reliance on first-language knowledge. In this respect, items in which Spanish and English syntax required completely different choices would have been preferable. However, the constraints of Spanish and English syntax, and the multiple-choice format, made it necessary to use the format found in Table 1 to cover the broadest possible range of syntactic patterns.

Table 1

Sample Item from Multiple-Choice Context Task

Transfer Version

The teacher obsafted to go to the board and write the answer.

The word obsaft is most likely to mean:

a) prevent b) order c) start d) disappear

Non-transfer Version

The teacher obsafted the student to go to the board and write the answer.

The word obsaft is most likely to mean:

a) prevent b) order c) start d) disappear

Table 2

Language Background Questionnaire, with Percentage of Students Giving Specific Answers

	Bilingual Instruction (n = 41)	English-Only Instruction (n = 45)
1. What country were you born in?		
USA	27	80
Mexico	54	13
Puerto Rico	17	4
Other Latin American countries	2	2
2. How long have you lived in the U.S.?		
Less than 2 years	18	0
2-3 years	28	0
4 years	28	6
5-10 years	13	21
12 or more years	15	74
3. When did you begin to learn English?		
Preschool	18	55
Kindergarten	5	23
Grades 1 or 2	21	16
Grades 3 or 4	10	7
After grade 4	46	0
4. Can you read in Spanish?		
Yes	100	68
No	0	32
5. Which language do you read better?		
Spanish	44	0
English	10	60
Same	46	40

Note. Numbers represent the percentage of students in each group giving a particular response.

Table 2 (Continued)

	Bilingual Instruction	English-Only Instruction
6. Which language do you speak better?		
Spanish	60	9
English	10	59
Same	30	32
7. Do your parents speak to you in Spanish?		
Always	85	57
Sometimes	13	9
Never	2	4
8. Do your parents speak to you in English?		
Always	13	18
Sometimes	47	68
Never	40	14
9. Which language do you use to speak with your brothers and sisters?		
Spanish	51	7
English	15	52
Both	34	41
10. Which language do you use to speak with your friends?		
Spanish	46	5
English	15	50
Both	39	45

Note. Numbers represent the percentage of students in each group giving a particular response.

Table 3

Transfer and Non-Transfer Errors

	Mean (*SD*)	Range
Bilingual Instruction (n = 41)		
Transfer	.24 (.14)	.00 - .55
Non-Transfer	.43 (.25)	.00 - .91
English-Only Instruction (n = 45)		
Transfer	.26 (.15)	.00 - .73
Non-Transfer	.15 (.14)	.00 - .55
Bilingual Graduate Students (n = 15)		
Transfer	.33 (.16)	.00 - .55
Non-Transfer	.10 (.08)	.00 - .19
Monolinguals (n = 48)		
Transfer	.16 (.12)	.00 - .36
Non-Transfer	.08 (.12)	.00 - .55

APPENDIX

Sample Items Representing Different Types of Syntactic Structures Tested

Each item is given first in the Transfer version, and then in the Non-Transfer version. The Transfer Error distractor is marked with an asterisk; the correct answer is marked with a plus sign. After each choice is listed the percentage of subjects choosing that option in the four groups of subjects: B (Bilingual), E (English-Only Instruction), G (bilingual graduate students) and M (Monolingual).

1. Target word: Main verb
   Critical context: Verb complement

Transfer Version

The teacher hopes that by now the students have learned from her example to appreciate the importance of reading. She *furates* that they read at least one book every week.

The word *furates* is most likely to mean:

	B	E	G	M
a) replaces	8	0	0	0
*b) tries	28	26	60	0
c) disappoints	16	0	0	0
+d) thinks	48	74	40	100

Non-Transfer Version

The teacher hopes that by now the students have learned from her example to appreciate the importance of reading. She *furates* to read at least one book every week.

The word *furates* is most likely to mean:

	B	E	G	M
a) replaces	13	4	0	0
+b) tries	69	92	100	93
c) disappoints	6	0	0	4
d) thinks	12	4	0	4

2. Target word: Verb after *have* in causative sense
   Critical context: Verb complement

Transfer Version

The patient arrived at the hospital complaining of chest pains and shortness of breath. The doctor had the patient *lerate* immediately.

The word *lerate* is most likely to mean:

	B	E	G	M
a) give	22	0	0	0
b) resemble	11	0	0	0
*c) bring in	33	32	12	4
+d) lie down	33	68	88	96

Non-Transfer Version

The patient arrived at the hospital complaining of chest pains and shortness of breath. The doctor had the nurse *lerate* the patient immediately.

The word *lerate* is most likely to mean:

	B	E	G	M
a) give	24	0	0	0
b) resemble	12	7	0	0
+c) bring in	52	74	40	71
d) lie down	12	19	60	29

3. Target word: Adjective
   Critical context: too/very

Transfer Version

John was very *fleard* to do well on the test.

The word *fleard* is most likely to mean:

	B	E	G	M
a) awake	6	8	0	4
+b) eager	28	72	88	89
c) different	11	0	0	0
*d) nervous	56	20	12	7

Non-Transfer Version

John was too *fleard* to do well on the test.

The word *fleard* is most likely to mean:

	B	E	G	M
a) awake	16	7	0	0
b) eager	4	15	40	0
c) different	12	0	0	0
+d) nervous	68	78	60	100

4. Target word: Noun
Critical context: Article

Transfer Version

After the accident, Mary decided to keep a diary. Now she spends a lot of time writing about the *crind*.

The word *crind* is most likely to mean:

	B	E	G	M
*a) life	19	8	12	0
b) finger	0	0	0	0
+c) past	75	88	88	96
d) distance	6	4	0	4

Non-Transfer Version

After the accident, Mary decided to keep a diary. Now she spends a lot of time writing about *crind*.

The word *crind* is most likely to mean:

	B	E	G	M
+a) life	58	85	100	95
b) finger	13	0	0	0
c) past	21	15	0	5
d) distance	8	0	0	0

5. Target word: Noun/adjective
Critical context: Following noun

Transfer Version

It was the first day of school. Everybody but one boy had been in the chemistry lab last year and knew how to use the equipment. Mrs. Smith, the teacher, showed the *troap* what equipment they would be using that day.

The word *troap* is most likely to mean:

	B	E	G	M
+a) boy	44	93	100	95
b) principal	20	0	0	5
c) book	28	7	0	0
*d) new	8	0	0	0

Non-Transfer Version

It was the first day of school. Everybody but one boy had been in the chemistry lab last year and knew how to use the equipment. Mrs. Smith, the teacher, showed the *troap* student what equipment they would be using that day.

The word *troap* is most likely to mean:

	B	E	G	M
a) boy	22	8	0	4
b) principal	6	4	0	0
c) book	17	0	0	0
+d) new	56	88	100	96

Figure 1
Error Type by Group

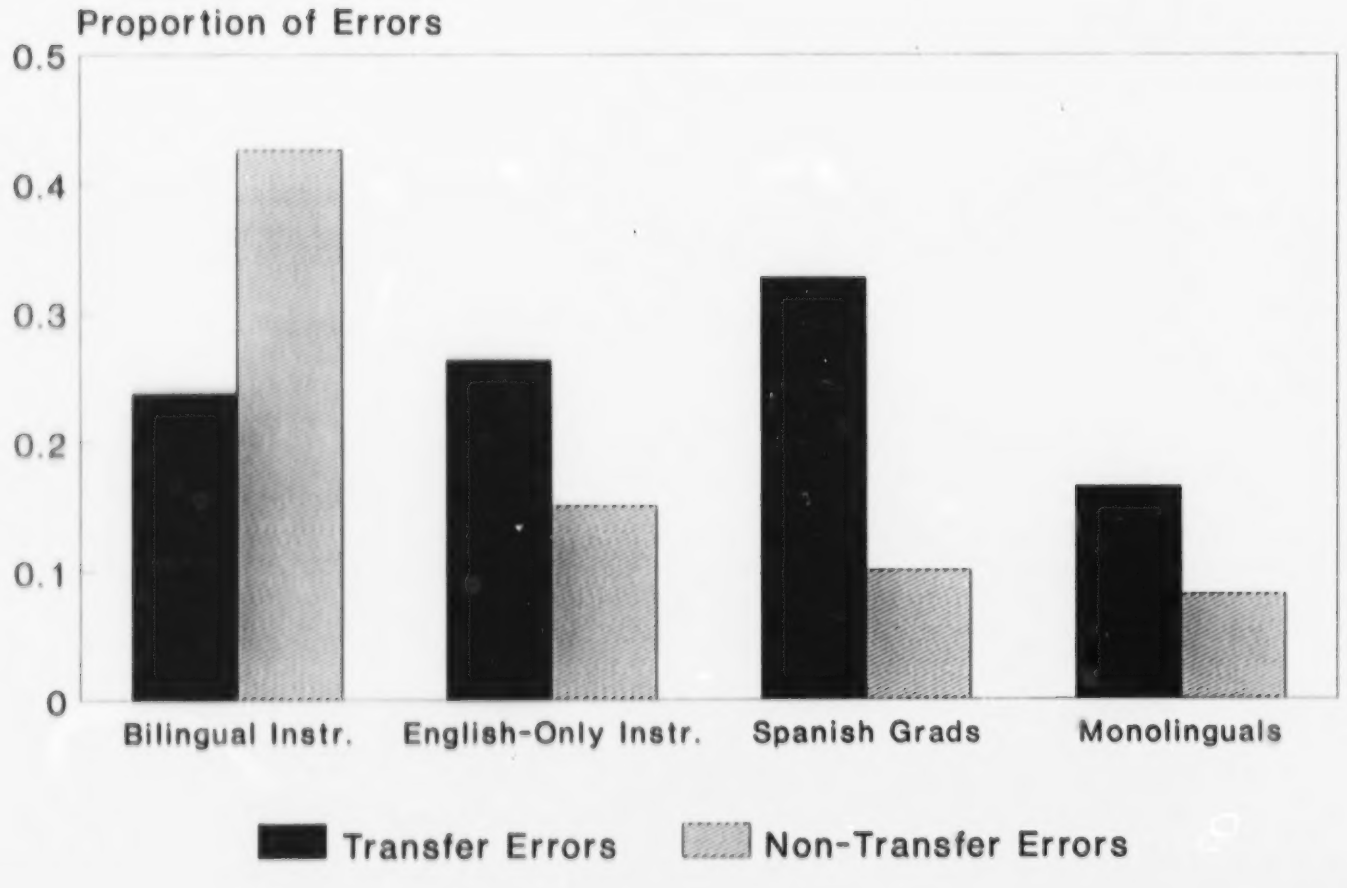

Figure 2
Error Types and English Reading Proficiency

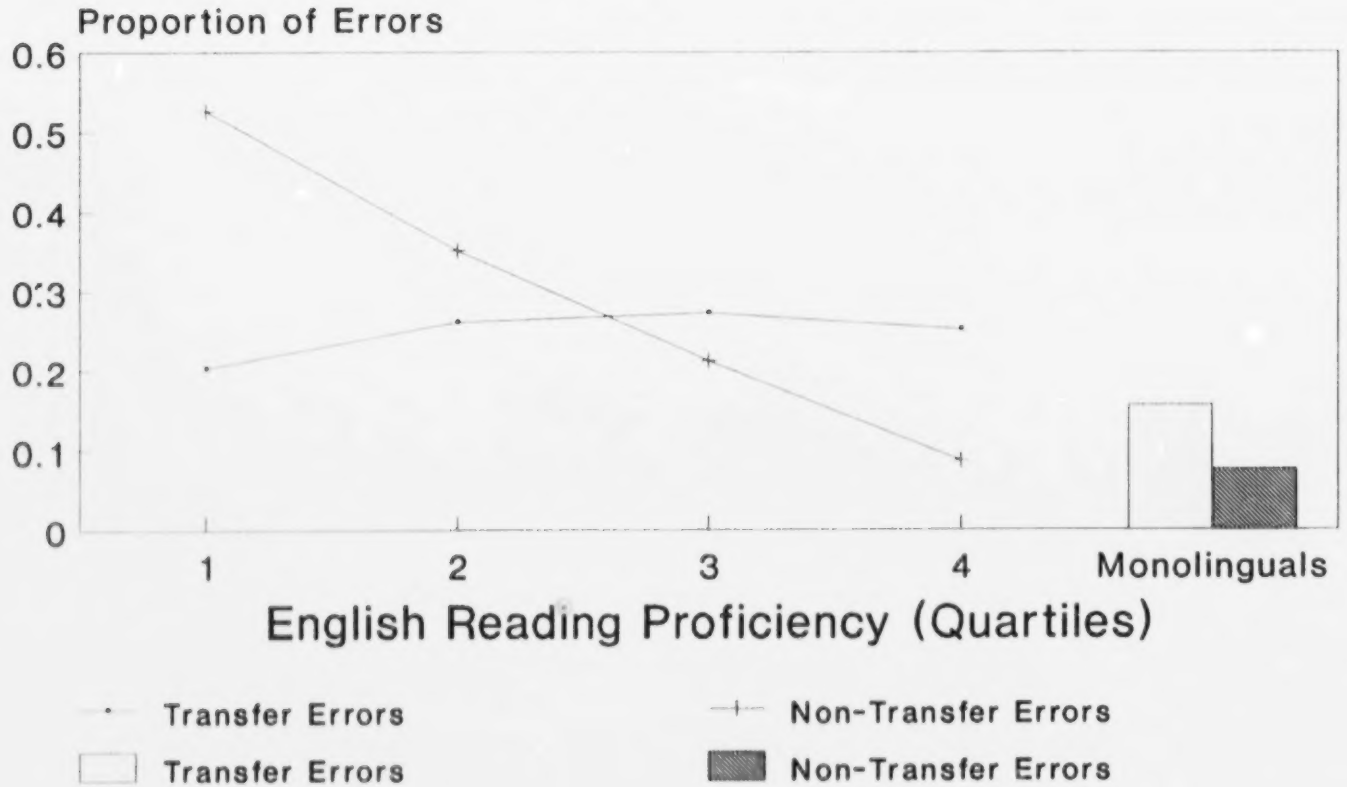

Figure 3
Error Types and Length of Residence in the US